

Physical exercises system to improve arm strength in baseball pitchers
Sistema de ejercicios físicos para mejorar la fuerza de brazos en los lanzadores de
Béisbol

Raschendy Loureiro-Minot¹, Kobel Guerrero-Muguerca², Nurimar Martínez-Pérez³

¹Univ. INDER. Guantánamo. Cuba.

²Univ. Assistant Professor. Guantánamo University. Cuba.

³Dr. Sc. Auxiliary Professor. Guantánamo University. Cuba

Email:

rachendylm@gmail.com

kobelq@cug.co.cu

nurimarmp@cug.co.cu

Reception date: September 1, 2023

Acceptance date: October 5, 2023

ABSTRACT

The objective of this article is to propose a system of physical exercises with a drag sled to contribute to the improvement of the arm strength in the pitchers of Guantánamo First Category Baseball team. To develop the research, methods and techniques such as documentary study, measurement, interview and observation, among others, were used to determine the elements that affect the preparation of arm strength in the aforementioned athletes, as well as to structure and develop the exercises system proposed to solve the problem object of study.

RESUMEN

El presente artículo tiene como objetivo proponer un sistema de ejercicios físicos con trineo de arrastre para contribuir a mejorar la fuerza de brazos en los lanzadores del equipo Guantánamo de Béisbol Primera Categoría. Para el desarrollo de la investigación se emplearon métodos y técnicas como el estudio documental, la medición, la entrevista y la observación entre otros que permitieron determinar los elementos que afectan la preparación de la fuerza de brazos en los atletas antes mencionados, así como estructurar y elaborar el sistema de ejercicios que se propone para solucionar el problema objeto de estudio.

Palabras clave

Arm strength; Physical exercise system; Drag sled; Baseball pitchers, First category.

Keywords

Fuerza de brazos; Sistema de ejercicios físicos; Trineo de arrastre; Lanzadores de béisbol; Primera categoría.

INTRODUCTION

Strength training as one of the components of the player's preparation is as important as the others, it facilitates the relationship of muscular work and balance with the others, therefore, it demonstrates the need to train it in conditions that allow more correspondence with the demands of today's baseball.

In this sense, for throwers it is an essential element to obtain excellent results in this sport that has its origins before the revolutionary triumph. The fastball is the most important pitch in Baseball, and if it is powerful enough its importance is even greater. The fastball is the basis of all pitches, whether breaking or changeup. Being faster, the other launches will be faster and more effective. To achieve good results, it is vital to develop arm strength in throwers, as this will allow them to strengthen the muscles that act in throwing and increase their power.

Currently, strength training in pitchers that particularly focuses on the muscular planes that are decisive for the execution of pitches, a precise element in performance, constitutes one of the tasks to be solved in Cuban baseball.

Hence, the objective of this article is to develop a system of physical exercises with a sled drag to contribute to the development of arm strength in the pitchers of the Guantánamo First Category Baseball team in order to improve both individual and collective sports results.

During the research, several bibliographic sources were consulted that constitute the theoretical basis for the proposed system of physical exercises. In this sense, strength in sport is defined by (González Escalona, 2020), which states that muscular strength.

“It is conceived as a conditional capacity taking into account two fundamental tendencies, the relationship of this capacity with the neuromuscular system and its ability to overcome through this any type of external resistance, such as: weights, gravity, water, a contrary, among others and the possibilities of the muscle to generate tension from the muscle fibers during a sporting activity with competitive objectives.” (p. 21)

On the other hand, (Moyano Coronado, 2020) who agrees with (Kraemer & Stone, 2014) in stating that strength training is:

“a specialized method of conditioning in which a person works against a wide range of resistances to improve health, fitness, and physical and/or sports performance. Forms of strength training include the use of body weight, machines, free weights (barbells and dumbbells), elastic bands, and medicine balls.” (p. 15)

Physical exercises in throwing practice, especially when the implement is very heavy, are an effective way to develop arm, trunk and leg strength. It is essential that when executing them the ability to perform great efforts at high intensities is perfected.

Regarding the definition of an exercise system (Ríos Escobar et al., 2021) agrees with (Duret Guzmán & Reyes Cabrera, 2010) that this is a *“set of different elements but closely related to each other and methodologically ordered, with the same ultimate goal.”* (p. 815)

Other elements that were taken into account for the development of the system are the different methods for training strength provided by several authors, including Ozolin (1970), Verkhoshansky (1974) and Schmidtbleicher et al. (1978) among others.

Taking these criteria as a reference and supported by the research methods and techniques, the instruments developed were applied to verify the insufficiencies that caused the problem studied.

METHODS

For the development of the research, the 19 athletes and 3 coaches from the pitching area of the Guantánamo First Category Baseball team were chosen as the population. The sample is made up of 100% of the population to whom the developed instruments were applied and was carried out on the grounds of the Nguyen Van Troi Stadium.

The theoretical investigation carried out allowed us to deepen our knowledge of the regularities and essential qualities of the phenomena. An analysis of the information consulted was carried out that allowed us to analyze and summarize the theoretical postulates related to the topic; the integration, interpretation and substantiation of the results obtained with the methods and techniques applied, as well as the taking of positions based on criticism of different sources and the assessment of the state of the phenomenon in social practice.

The phenomenon under study was modeled to understand on an abstract level the essential relationships and properties of the proposed physical exercise system based on the representation that reveals the place of each of its components, their relationships (internal and external), their main qualities and its functioning to reveal itself as an integrated system.

To obtain and prepare empirical data and knowledge of the fundamental facts that characterize the phenomenon under study, they were observed during the training sessions to collect information on the main factors that affect and can enhance the development of arm strength. in the pitchers of the Guantánamo First Category Baseball team, in addition to monitoring the levels of evolution and control in the application of the proposed physical exercise system.

Various documentary sources were studied and analyzed to compile and systematize regulatory documents, theses, books, videos, scientific articles, project results as well as the information that reaches the province from the CINID of INDER related to the development of the force in the baseball pitchers in order to determine difficulties and potentialities.

Specialists and trainers from the territory were consulted to corroborate the main factors that affect and can enhance the development of arm strength in the pitchers of the Guantánamo First Category Baseball team, necessary for the correct structuring and development of the proposed exercise system.

A pre-test was carried out, in the second and third microcycle of the macrocycle of the preparation stage planned for the National Series, which allowed determining the levels of arm strength in the pitchers of the Guantánamo First Category Baseball team necessary to determine the loads to be planned for each athlete in each of the exercises of the proposed system, as well as a measurement with a radar gun to determine how the strength preparation is reflected in the power of the throws. These elements allowed us to determine the initial load levels to be used by each athlete in the proposed physical exercises.

An interview was conducted with the throwing area coaches of the Guantánamo First Category Baseball team at various moments of the empirical investigation, to delve into specific aspects of interest, regarding the use of different media and alternative exercises, with emphasis on sledging, drag, for the development of strength in baseball pitchers.

A consultation with specialists was also carried out, as well as a partial application of the exercise system during the development stage that made it possible to collect criteria and data that made it possible to improve its conception and its subsequent full implementation.

The results obtained demonstrate the need for changes in the conception of the preparation of arm strength in the pitchers of the Guantánamo First Category Baseball team, from the attention given to them to strengthen the muscular planes that intervene in pitches with performing exercises and using alternative means; to perfect their work as pitchers in order to achieve superior competitive results.

The features that characterize the problem currently being studied and the analysis carried out demonstrate the need for the development and implementation of a system of exercises with a sled to contribute to the development of arm strength in the throwers of the Guantánamo team. First Category Baseball.

RESULTS

The proposed exercise system has the operational objective of promoting the adequate development of arm strength in its different variants with the use of a drag sled that affects the quality of work of the pitchers of the Guantánamo First Category Baseball team.

Guidelines for your application

In the initial diagnosis, each coach will determine what type of tests he will apply, taking into account the somatic characteristics of his athletes and the means he will use.

The application of the exercise system for the development of strength in the upper body of pitchers in first category baseball must start from an initial diagnosis related to general strength in the muscular planes that cover the neck, shoulders, arms, back and the trunk that allows determining the development of these muscular planes before implementing the proposal.

Given the characteristics of the exercise system proposed in this work for the development of conditional capabilities with emphasis on strength, its use is suggested in the general physical preparation stage as part of the training of pitchers in first category baseball. as well as its use in the technical-tactical preparation stage in a lower percentage than in the previous stage given its positive influences on the technical movements of pitching.

Exercises that make up the system

Exercise # 1. Butterfly.

Exercise # 2. Triceps.

Exercise # 3. Rowing.

Exercise #4. Lateral Shoulder Strength.

Exercise # 5. Biceps.

Exercise # 6. Shoulder Strength Ahead.

One of the exercises of the system is explained below as an example.

Exercise # 1. Butterfly

Variation: Supine position with feet towards the sled

Objective: increase upper body strength with emphasis on the deltoid muscles.

Muscles involved: From the trunk: the rectus abdominis, lumbar trigone, spinal cord tensors, latissimus dorsi and pectoralis major. Arms: trapezius, deltoid, infraspinatus, supraspinatus, subscapularis, teres minor and major. Forearms: metacarpals, flexor digitorum superficialis, palmaris major, extensor longus radialis, and brachius radialis.

Development: from the supine position (lying back) the athlete places the legs extended shoulder-width apart, the arms extended to the sides of the body holding the ropes tied to the sled located at an starting point by the handles. The athlete performs a circular movement with both arms from the sides towards the top of the head. When the athlete performs the return movement to the initial position with his arms bent in front, the teacher, in a coordinated movement with the athlete, returns the sled to its starting point using a rope held in the athlete's hand. length than those of the athlete. In the second variant, the work of the arms is done in the opposite direction to the previous one, keeping the athlete supine. Both variants are performed prone (variants 3 and 4).

Variants 5, 6, 7 and 8 are executed the same as the previous ones but placing the sled aligned with the athlete's head.

Dosage: *Quick strength:* 6 to 10 repetitions of 2 to 4 series are recommended, execute them in the shortest time possible. You should work from 65% to 75% of the maximum strength achieved by the athlete in the initial diagnosis.

Strength resistance: it is recommended to work 11 to 15 repetitions of 2 to 4 sets. The weight of the sled may be 40% to 60% of the maximum strength achieved by the athlete at initial diagnosis.

Explosive strength: it is recommended to work 4 to 6 repetitions of 2 to 4 sets. The weight of the sled may be 70% to 80% of the maximum strength achieved by the athlete at initial diagnosis.

Recovery methods: 30 to 45s between sets and 45s to 2min between sets

Variants: the exercise has 8 variants, four of them with the sled in line with the feet and four in line with the head, four are performed supine and four are performed prone.

DISCUSSION

The novelty of this research lies in a system of physical exercises with a drag sled to help improve arm strength in the pitchers of the Guantánamo First Category Baseball team where the main methodological elements are taken into consideration that include work directed towards the development physique of the pitchers.

In this regard, various researchers have approached the phenomenon under study from different angles and have proposed different solutions with various means, but none of them use the drag sled to complement the preparation of arm strength in pitchers in First Category Baseball.

To prepare the proposal, the criteria of different authors were taken into account, from whom the concepts necessary for the development of the exercise system were assumed, such as the definition proposed by (González Escalona, 2020), from which the two fundamental tendencies of strength as principles for developing exercises.

The concept of strength training from (Moyano Coronado, 2020) is also assumed, but including that in addition to the means that it proposes, others can be used in the forms of training that are proposed, such as the drag sled, among others. Regarding the definition of the exercise system, it agrees with that offered by (Ríos Escobar et al., 2021) since it fits the objectives of this research.

The different methods for training strength proposed by Ozolin (1970), Verkhoshansky (1974) and Schmidtbleicher et al. are also assumed. (1978) and others, because they allow the teacher to select and apply, as far as possible, the most effective methods in correspondence with specific situations, practice their application, try new ways and train their athletes to consciously obtain better results.

To conclude, it can be stated that the system of exercises with sled drag constitutes an auxiliary means for the arm strength training process in the pitchers of the Guantánamo First Category Baseball team, as well as its contribution from the educational point of view to the training of throwers and other practitioners in preparation for social interaction under the influence of sports activities in correspondence with the system of values and ideals of the Cuban nation, based on the roots of pedagogical, Martí and Marxist-Leninist thought. In addition, it contributes to the decrease in the use of invasive methods in the practice of physical exercise.

BIBLIOGRAPHIC REFERENCES

- Duret Guzmán, Y., & Reyes Cabrera, A. (2010). Sistema de ejercicios para la preparación técnica de los receptores en béisbol de la categoría 11-12 años del área deportiva «Julio Antonio Mella» del municipio Camagüey. *Efdeportes.com*, 150, 1.
- González Escalona, L. E. (2020). *Ejercicios con pelotas medicinales para mejorar la fuerza muscular de los lanzadores de béisbol* [Tesis de Maestría, Universidad de Granma]. Tesis unida Luis Ernesto.pdf.
- Moyano Coronado, N. C. (2020). *Entrenamiento de fuerza e hipertrofia desde la aplicación de un enfoque nutricional: Revisión bibliográfica* [Trabajo de grado, Universidad de Ciencias Aplicadas y Ambientales]. nicolas_camilo.pdf.
- Ríos Escobar, R., Hernández Sainz, M., Lechuga Domínguez, Y., Arias Hernández, E., & Alonso Águila, M. (2021). Sistema de ejercicios prácticos para el desarrollo de habilidades profesionales para estudiantes de enfermería. *Revista Electrónica de PortalesMedicos.com*, 16(15), 815.